MEASUREMENT OF TRACE LEVEL DECHLORANE FLAME RETARDANTS IN FOOD AND FEED BY GC-MS/MS

Benjamin L'homme[1], Chiara Calaprice[2], Catherine Brasseur[1], Carlo Zambonin[3], Jean-François Focant[1]

[1] OBiAChem - University of Liège, Allée du 6 Août, B6c, B-4000 Liège, Belgium

[2] Dipartimento DICATECh - Politecnico di Bari, Via Orabona, 4, 70125 Bari, Italy

[3] Dipartimento di chimica - Università di Bari, Via Orabona, 4, 70125 Bari, Italy

Dechlorane or Mirex was extensively used as a pesticide but also as an additive flame retardant in the USA during the 1960s and the 1970s. After its ban, other related compounds such as Dechlorane Plus (DP), Dechlorane 602, Dechlorane 603, Dechlorane 604, and Chlordene Plus (CP) became candidates to replace Mirex due to their similar properties [1].
The environmental occurrence of dechlorane-related compounds was first reported in 2006 in North America when DP was detected in air, sediment and fish samples from the Laurentian Great Lakes [2]. Quite recently, their presence in significant amounts in environmental samples from Canada was also reported [3]. The presence of those compounds in the environment is of concern and so far, no data are available on the route of exposure to human. As first part of the study, we reported levels of Dechloranes in human serum from France [4], and suggested that possible routes of exposure such as food consumption should be investigated.
The aim of the second part of the study is to develop a method based on GC-MS/MS to measure Dechlorane 602, 603, 604, DP, CP, and Mirex in feed/food samples collected during continuous EU monitoring for dioxins. We optimized the MRM transitions and validated the method to be able to report first data of levels of Dechlorane in foodstuffs. These data can be crossed with food habits to estimate a human dechlorane daily intake.

References

[1] International Program of Chemical Safety: Environmental health criteria 44, mirex. Report available at: http://www.inchem.org/documents/ehc/ehc/ehc44.htm. Accessed May 2013

[2] Hoh E, *et al*. Environ Sci Technol. **40** (2006) 1184

[3] Sverko, *et al*., Environ. Sci. Technol. **44** (2010) 574

[4] Brasseur, *et al*., Environ. Int. **65** (2014) 33